

REMARKS**Status of Claims**

Claims 1-10 are pending, of which claims 1 and 10 are independent. Claim 1 has been amended to more clearly define the intended subject matter. Claim 10 has been added. Support for the amendment and the new claim is found, for example, at FIG. 1 and paragraph [0017] beginning at page 8, line 18 of the specification. Care has been taken to avoid introducing new matter.

Claim Rejection - 35 U.S.C. § 103

Claims 1-4 and 7-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dohle et al. (WO 03/047010, using US 2005/0084729) in view of Grot (USP 6,663,862). Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Dohle et al. in view of Grot, and further in view of Gorman et al (USP 6,124,054). Claims 6 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dohle et al. in view of Grot, and further in view of Luft et al. (USP 6,509,112). These rejections are traversed for at least the following reasons.

The Examiner asserts that Dohle discloses a fuel cell system comprising a fuel cell and a purifying apparatus, as recited by claim 1 except for the anode side porous layer in a purifying apparatus. The Examiner then relies on Grot asserting that Grot discloses the use of diffusion layers on opposing sides of a catalyst layer.

Applicants respectfully submit that none of the cited references discloses or suggests that “effluent discharged from said anode is always passed through said porous sheet and discharged from said outlet, and the effluent is directed to said porous sheet without being mixed with the air in advance,” as recited by amended claim 1.

In Dohle, the effluent discharged from anode A is directed to the path 2. The alleged porous sheet 3 of Dohle is disposed in parallel between the path 1 and path 2. As FIGS. 1 and 2 of Dohle clearly show, only H_2O and O_2 gases appear to pass through the alleged porous sheet 3. In other words, in Dohle, the effluent from the anode is purified at a surface of the catalyst layer 4 (see, paragraphs [0010]-[0016] of Dohle). As such, it is clear that most of the effluent from anode A in Dohle does not pass through the porous sheet 3 (see, the arrow in path 2 of FIG. 2 of Dohle).

In contrast, in the present subject matter, the effluent discharged from the anode is always passed through the porous sheet, because the porous sheet is disposed to intersect the gas flow (see, FIG. 1 of the present application). With this feature:

[M]ost of unreacted fuel or by-products have a chance to come into contact with the catalyst. Hence, unreacted fuel or by-products are catalytically combusted with high efficiency, thereby being converted into water and carbon dioxide. Also, the effluent discharged from the anode is introduced into the purifying apparatus having the catalyst layer without being mixed with air in advance, and it reaches the porous sheet separately from air. The fuel diffusing from one side of the porous sheet and the oxygen in the air diffusing from the other side come into contact with the active sites inside the catalyst layer, and combustion takes place. Therefore, the effluent discharged from the anode is prevented from being swept away by a large amount of air without coming into contact with the active sites of the catalyst layer, and the residence time of the remaining fuel, during which it comes into contact with the active sites and reacts with oxygen, becomes longer. Further, since there is no need to pass the air for catalytic combustion through the porous sheet, the pressure loss in supplying the air for catalytic combustion can be made small (see, paragraph [0017] of the specification).

Thus, it is clear that Dohle fails to disclose that “effluent discharged from said anode is always passed through said porous sheet and discharged from said outlet, and the effluent is directed to said porous sheet without being mixed with the air in advance,” as recited by amended claim 1. It is also clear that the remaining cited references do not cure the deficiency of Dohle, and it would not have been obvious to add this feature to any combination of the cited references.

Applicants respectfully submit that Dohle also fails to disclose that the effluent is directed to the porous sheet without being mixed with the air, as recited by claim 1. In Dohle, the alleged second flow path (flow 1) is a supply line for supplying “air” as an oxidizing agent (see, paragraph [0013] of Dohle) to the cathode compartment K (see, paragraph [0018] of Dohle). As it is clear from FIG. 2 of Dohle, the effluent from anode A is mixed with the effluent from cathode K before reaching the porous sheet 3. It should be noted that the input of the cathode K is air as set forth above, the effluent from the cathode K is still air. As such, the effluent discharged from the anode A is mixed with the air, which passes through the cathode K, before arriving at the alleged purifying apparatus 3.

In the Advisory Action, the Examiner asserts that it is obvious that the oxidant flow path is separated from the fuel supply path. However, Dohle clearly states “the supplied air (oxidizing gas)” is supplied by a supply duct (1) (see, paragraph [0013] and claim 1 of Dohle). Thus, it is clear that the air, as an oxidizing agent, is supplied through the supply duct 1 to the cathode K, is discharged from the cathode K, and is mixed with the effluent from anode A.

Thus, Dohle fails to disclose that effluent is directed to the porous sheet without being mixed with air. It is also clear that none of the remaining cited references discloses or suggests the above identified features of claim 1, and it would not have been obvious to add this feature to any combination of the cited references.

Further, Applicants respectfully submit that Grot is directed to a structure of a fuel cell electrode, while the present subject matter is directed to a fuel cell system including a *purifying apparatus*. It is clear that the *porous sheet*, through which the effluent discharged from the anode is passed, is a part of the *purifying apparatus* in the present subject matter. Since in Grot, the alleged porous sheet (diffusion layers 15, 15A) is a part of the electrode (either a cathode or

an anode), the effluent discharged from the anode (i.e., electrode) does not pass through the porous sheet. Although Grot appears to disclose the use of a porous sheet, it is clear that Grot fails to disclose that *“the effluent discharged from said anode is passed through said porous sheet and discharged from said outlet,”* as recited by claim 1. It is also clear that none of the remaining cited references disclose or suggest the above identified features of claim 1.

In the Advisory Action, the Examiner asserts that Grot discloses “the use of diffusion layers on catalysts (electrode, cleaning device).” However, Grot appears to fail to disclose anything about a “cleaning device.” It is requested that the Examiner point out where in Grot the alleged cleaning device is disclosed, and explain why the structure of the “purifying apparatus” of Dohle is replaceable with the structure of “electrode” of Grot.

Accordingly, in view of the foregoing remarks, Applicants respectfully submit that none of the cited references, taken alone or in any combination thereof, renders claim 1 or any claims dependent thereon obvious. Thus, it is requested that the Examiner withdraw the rejections of claims 1-9 under U.S.C. § 103(a).

New Claim

Claim 10 recites that *“the effluent discharged from said anode is intersectionally passed through said porous sheet and discharged from said outlet, and the effluent is directed to said porous sheet without being mixed with the air in advance.”* As set forth above, the effluent from the anode in Dohle flows parallel to the porous sheet 3, but does not intersectionally pass through the porous sheet 3. Accordingly, claim 10 is patentable over the cited references for at least the similar reasons as claim 1.

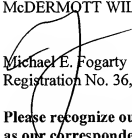
Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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